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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/490,162 01/22/00 LOXLEY

T 104

EXAMINER

MMC2/1019

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Suite 116  
Cleveland OH 44132

SIMKOVIC, V

ART UNIT

PAPER NUMBER

2812

DATE MAILED:

10/19/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

**Office Action Summary**

Application No.

09/490,162

Applicant(s)

LOXLEY, TED A.

Examiner

Viktor Simkovic

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 September 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 15-17 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-12 is/are allowed.
- 6) ☒ Claim(s) 1-8, 13 and 18-30 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1, 2, 4, 8, 18, 21, 26, 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Flitsch et al. Flitsch et al. teach a method of removing ions from the surface of a wafer using direct current source during wet processing to provide an effective field intensity. See the abstract, where Flitsch et al. disclose using a corona discharge followed by a deionized water rinse to remove alkali ions from the surface of a wafer. With regards to claim 2, since the particles removed are ions, they are smaller than 0.1 micron. With regards to claim 4, see column 1, line 29 of Flitsch et al., where it is stated that the rinse might be preceded by a CMP operation. With regards to claim 8, the voltage taught by Flitsch et al. is above 100 V. This covers the limitations of claims 18 and 26 as well.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5-6, 19-20, 22, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flitsch et al. as applied to claim 1 above and further in view of Applicant's admitted prior art. Applicant discloses in the specification on pages 2-9 that it is common practice in the industry to include treatment with a high-purity dilute acid solution during the CMP processing, as well as treatment with a nonpolar compound. With regards to claim 19, Applicant also discloses it as common practice to use silica or aluminum particles of sizes from 0.01 to 0.03 microns in the abrasive step of the CMP processing, followed by the DI rinse. This also covers the limitations of claim 20. With regards to claim 22, as stated above, the filed intensity taught by Flitsch et al. is well above 0.02 volts/mm. Finally, with regards to claim 29, as the Applicant mentions in the specification, the steps of using hydrogen peroxide, followed by an acidic solution, followed by a rinse are well known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to perform all these steps prior to the water rinse as taught by Flitsch et al., as these are all well known processes which lead up to the need for the rinse in the first place.

Claims 3, 7, 23-25, 27, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flitch et al. in view of Kishii et al. for claims 3 and 7, and further in view of Applicant's admitted prior art as applied to claim 20 above for claims 23 and 24. Kishii et al. teach a similar method of applying a voltage across the face of a wafer while a rinse is performed. Kishii et al. also teach that the voltage between the electrodes is 3 volts (see column 3, lines 25). It would have been obvious to one of ordinary skill in the

art at the time of the invention to use this voltage as taught by Kishii et al., as it would allow the removal of the desired impurities with a smaller voltage than that taught by Flitsch et al., thus reducing the power requirements of the equipment. Also note that Kishii et al. teach the use of megasonic energy to assist in the cleaning process.

### ***Response to Arguments***

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies are not recited in the rejected claim(s). Applicant argues that the claimed process differs from that of Flitsch et al. with regards to temperature. None of the independent claims mention any temperature limitations. This also applies to the effective field intensity. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

With regards to arguments against the 103 rejection combining the teaching of Flitsch et al. and Kishii et al., applicant argues that the law requires the secondary reference to be common knowledge and describes the Japanese patent as an obscure reference. The examiner is unfamiliar with any such case law that the applicant is relying on, and labeling any reference as obscure, especially a patent, seems arbitrary. Furthermore, applicant argues that there is no logical or proper basis for concluding that the process taught by Kishii et al. "would allow the removal of desired impurities". The abstract of Kishii et al. , however, clearly states that the object of the invention is "to

make it possible to sufficiently remove particles without damaging parts of the semiconductor devices such as wiring”.

***Allowable Subject Matter***

Claims 9-13 are allowed.

Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Prior art of record fails to teach the method of performing wet cleaning operations while a wafer is placed in a quartz receptacle such that the front face of the wafer is in parallel with a face of the receptacle and is separated from it by less than 5 mm.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Viktor Simkovic whose telephone number is 703-308-6170. The examiner can normally be reached on Mon - Fri, 9:00 - 6:00, except every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on 703-308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Viktor Simkovic  
October 9, 2001



John F. Niebling  
Supervisory Patent Examiner  
Technology Center 2800